

THE FLAT BUG GENUS *CALISIOPSIS* CHAMPION:
A REVIEW WITH DESCRIPTIONS OF THREE
NEW SPECIES, INCLUDING ONE FROM
DOMINICAN REPUBLIC AMBER
(HETEROPTERA: ARADIDAE)

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Abstract.—A review of the Neotropical flat bug genus *Calisiopsis* Champion gives a key to separate its nymphs from those of *Calisius* Stål; a diagnosis, habitus drawing, and lectotype designation for the type-species *C. ampliceps* Champion; descriptions and habitus drawings of three new species [*C. brodzinskyorum* found in amber from the Dominican Republic, *C. kormilevi* from a forest canopy in Peru, and *C. nigrotuberculata* from Mexico]; and a key to the seven known species.

Discovery of three new species of *Calisiopsis* Champion, one represented by a single specimen in amber from the Dominican Republic, one consisting of a series of adults and nymphs taken during a survey of a forest canopy in Peru, and the third a single specimen from Mexico, presented an opportunity to review the genus and offer a key to its seven species.

The existence of an amber fossil hemipteran of a modern genus not otherwise represented on Hispaniola is not unique here; Popov (1987a, 1987b) described amber specimens in two modern genera of assassin bugs (Reduviidae: *Malacopus* Stål and *Empicoris* Wolff) not previously cataloged from this large island.

Fortunately, the primary types of all of the previously described species were available for examination: the syntypes of the type-species lent by The Natural History Museum in London; the other three in the Smithsonian Institution, National Museum of Natural History. All measurements given below are in millimeters.

Genus *Calisiopsis* Champion

Calisiopsis Champion, 1898:67. Type species: *Calisiopsis ampliceps* Champion, only included species.

Champion's genus *Calisiopsis* was treated as a junior synonym of *Calisius* Stål (1860: 68) by Usinger and Matsuda (1959:93), but in that latter year it was diagnosed as a distinct genus by Kormilev (1959a:210; see also 1959b:320) who presented the following couplet to separate the two genera:

Anterior process of the head more robust; antennae normal, generally with the segments increasing in length from the first to the fourth; hypopygium of the male big, dorsocaudal or caudal in position, clearly visible from above . . .

..... *Calisius*
Anterior process of the head relatively narrower and more protruding; the first three antennal segments very short, moniliform, the fourth as long, or almost as long, as the first three together, and granulated; hypopygium of the male flat, displaced on the ventral surface, and removed from the hind border, not visible from above . . . *Calisiopsis*

Later, when presenting a key to the six genera of the subfamily Calisiinae Stål, Kormilev (1986:249-250) again recognized that the elongate and dotted antennal segment IV separated *Calisiopsis* from *Calisius* in which the undotted antennal segment IV

was shorter than the combined lengths of antennals I–III. Four species of *Calisiopsis* were keyed by Kormilev (1976:70) and cataloged by Kormilev and Froeschner (1987: 57–58).

Apparently the nymphs of *Calisiopsis* have not yet been characterized. Fortunately, the series of the new species *C. kormilevi* included a number of nymphs of several instars; a dorsal habitus drawing of a fifth-instar nymph is herein given as Fig. 5. In all of these nymphs, plus an unidentified *Calisiopsis* nymph from Mexico, the very short antennal segments I–III combined were about as long as or very slightly shorter than the large, fusiform, antennal segment IV. On these nymphs the location of each scent gland opening at the apical margin of abdominal segments III–V plus the pattern of the glabrous areas confirm Usinger and Matsuda's (1959:93) conclusion that the subfamily Calisiinae is more similar to the subfamily Aradinae than to the subfamily Mezirinae [see their figs. 12a and 12c] to which it was once assigned. Comparing this pattern with the only fifth-instar nymph of the genus *Calisius* (*C. homalantha* Kormilev) at hand permits making the following couplet to separate the last nymphal instars of these two genera [recognizing the fact that material is available for only one species in each genus]:

Antennal segment IV with numerous small pale dots, its length as long as or longer than combined lengths of moniliform segments I–III. Median scent gland openings prominent, surrounded by darkened ring. Entire series of inner glabrous areas subequal in size, broader than transverse width of scent gland opening. Glabrous areas of second row from midline smaller than the inner series, becoming progressively smaller posteriorly. Fig. 5 *Calisiopsis*
 Antennal segment IV not dotted, its length distinctly shorter than combined lengths of cylindrical segments I–III. Median scent gland openings smaller

than in *Calisiopsis*, edges concolorous with surrounding dorsum. Both rows of glabrous areas inconspicuous, much smaller than gland openings *Calisius*

Key to adults of the species
 of *Calisiopsis*

1. Scutellar disc between median carina and lateral margins with evident elevated blunt tubercles 2
- Scutellar disc without elevated tubercles 4
2. Head, in lateral view, with dorsal outline of anterior lobe directed approximately at midheight of eye (Fig. 7). Interocular area of head, including midline, distinctly lower than dorsal margin of eye. Length 2.8–3.4. (Figs. 2, 7) *kormilevi*
- Head, in lateral view, with dorsal outline of anterior lobe directed much above midheight of eye. Interocular midline as high as dorsal margin of eye 3
3. Tubercles on anterior lobe of head short, blunt, arranged in two rather regular, well separated, longitudinal rows: 1 lateral, 1 dorsolateral. Tubercles along free edge of connexivum, except one at posterior angle of each segment, inconspicuously small. Length 3.4 (Fig. 3)
 *nigrotuberculata*
- Tubercles on anterior lobe of head, especially anteriorly, longer than wide, irregularly placed. Tubercles along free edge of connexivum all prominently projecting. Length 3.4 (Fig. 4) *brodzinskyorum*
4. Head with anterior lobe outlined laterally by a single row of large, prominently radiating, blunt tubercles. Length 3.6 (Fig. 6) *planiceps*
- Head with anterior lobe laterally with scattered small tubercles or none 5
5. Tubercles on midline of interocular area, viewed anteriorly, slightly

- higher than dorsal margins of eyes. In lateral view, anterior lobe of head with dorsal outline directed at or slightly above dorsal margin of eye. Length 2.9 (Fig. 8) *minuta*
- Tubercles on midline of interocular area, viewed anteriorly, distinctly lower than dorsal margins of eyes. In lateral view, anterior lobe of head with dorsal outline directed well below dorsal outline of eye 6
6. Anterior lobe of head, in lateral view, with dorsal outline subhorizontal, directed slightly below midheight of eye. Length 3.0 *brasiliensis*
- Anterior lobe of head with dorsal outline clearly diagonal, directed toward upper fourth of eye. Length 2.8–2.9 (Fig. 1) *ampliceps*

Calisiopsis ampliceps Champion
Fig. 1

Calisiopsis ampliceps Champion, 1898:67
(new species: Panama).

Diagnosis.—This species differs from all other known species in the genus by the combination of the lack of elevated tubercles on each side of the scutellar median carina plus the dorsal outline of the anterior head lobe being directed at the upper fourth of the eye.

This species appears to be known only from the type series, which consisted of three Panamanian specimens: two from Bugaba and one from Tolé. Champion commented that the Tolé specimen showed some differences and added “it may belong to a different species”—thus actually excluding it from the cotype series.

Through the kind cooperation of W. R. Dolling of the British Museum (Natural History), London, and T. J. Henry of the U.S.D.A., Systematic Entomology Laboratory, I was able to examine the two Bugaba specimens. They are glued side-by-side on a pinned cardboard rectangle—the left

one, a male, ventral side up, the right one, a female, dorsal side up. The two specimens undoubtedly represent the same species and I hereby designate the right specimen (dorsal side up) as the lectotype. The six labels read, (1) “♀”; (2) “Type” [a red-bordered circular label, apparently labeled subsequent to Champion’s study]; (3) “B.C.A. Rhyn.II. *Calisiopsis ampliceps* Ch.♀”; (4) “Bugaba, Panama, Champion;” (5) “Sp. figured”; (6) “Lectotype designation by Froeschner, 1991-right spm.”

The various subsequent descriptive treatments of *C. ampliceps* were based on mis-determinations. Kormilev (1959a:222) recognized his earlier (1956:149) error based on a Brazilian specimen and made that specimen the holotype of his new species *Calisiopsis brasiliensis*. However, the specimen which he treated as *C. ampliceps* in his 1959a paper is not the same as Champion’s species; it is here described as the new species *Calisiopsis nigrotuberculata*.

Distribution.—Panama.

Calisiopsis brasiliensis Kormilev

Calisiopsis ampliceps.—Kormilev, 1956: 149.

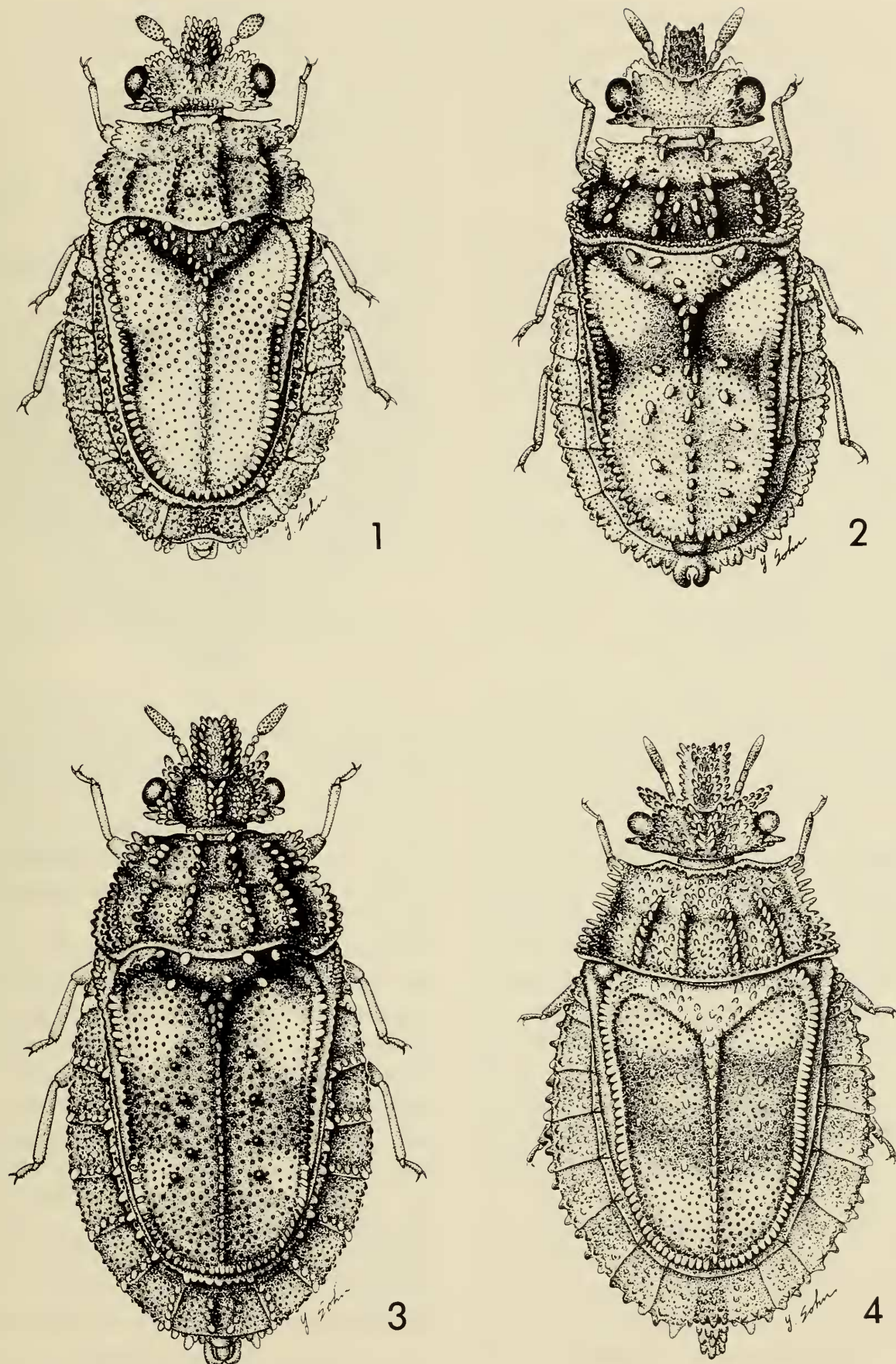
Calisiopsis brasiliensis Kormilev, 1959a:222
[new species: Brazil].

Diagnosis.—This species may be distinguished from all other known members of the genus by the combination of lack of elevated tubercles each side of the median scutellar carina plus the dorsal outline of the anterior head lobe directed slightly below the midheight of the eye. Because the head is missing from the holotype (the only known specimen), the head character used in the above key was derived from statement in the original proposal.

Distribution.—Brazil.

Calisiopsis brodzinskyorum, new species
Fig. 4

Diagnosis.—As keyed above, this fossil species may be recognized among the known



Figs. 1-4. 1. *Calisiopsis ampliceps* Champion, natural length 2.90; 2. *Calisiopsis kormilevi*, new species, natural length 3.0; 3. *Calisiopsis nigrotuberculata*, new species, natural length 3.4; 4. *Calisiopsis brodzinskyorum*, new species, natural length 2.5.

species of the genus by the combination of the scutellum having weakly elevated pale tubercles on each side of the scutellar midline, the interocular area of the head not depressed, and the tubercles along the free edge of the connexivum prominently projecting.

Description. — Holotype ovate, length 2.50, greatest width 1.28. Aspect typical for genus with tubercles on head, in 4 longitudinal rows on pronotum, and along margins of pronotum, abdomen, and scutellum.

Head: Wider than long, 0.71:0.49; anterior lobe with numerous scattered tubercles laterally and dorsolaterally, dorsal outline pointing to upper margin of eye. Antenna about two-thirds as long as head, segments I–III very short, almost moniliform (awkwardly positioned in the amber, making accurate measuring impossible), their combined lengths as long as IV, latter with small pale dots.

Pronotum: Wider than long, 1.24:0.49; anterior margin sinuately transverse, collar not projecting; posterior margin slightly convex. Scutellum with mediobasal triangular elevation bearing a few tubercles, midline behind it marked by a row of low tubercles; disc each side of midline with a few tubercles scattered, not in rows. Connexival segments and their laterotergites appearing flat, without an elevated rim between them.

Abdomen ventrally without tubercles.

Color: Mostly brown (appearing translucent in the amber), base and apical third of scutellum noticeably paler; tubercles apparently concolorous with surrounding exoskeleton. Legs dark, apparently without pale markings.

Holotype ♀. — Dominican Republic, in amber. The species description is based on a lone specimen in the Brodzinsky/Lopez-Penha collection now in the National Museum of Natural History, Smithsonian Institution.

Comments. — In Davis' (1989:545–550) discussion of that collection of amber, he noted that the amber “is found as secondary

deposits in mid-Tertiary sandstone marine silts which may range between 20–30 million years in age”; because the amber was covered by the particles forming the sandstone it must be older than the stone. As yet, no modern species of *Calisiopsis* has been reported from the Dominican Republic.

Distribution. — Dominican Republic (fossil in amber).

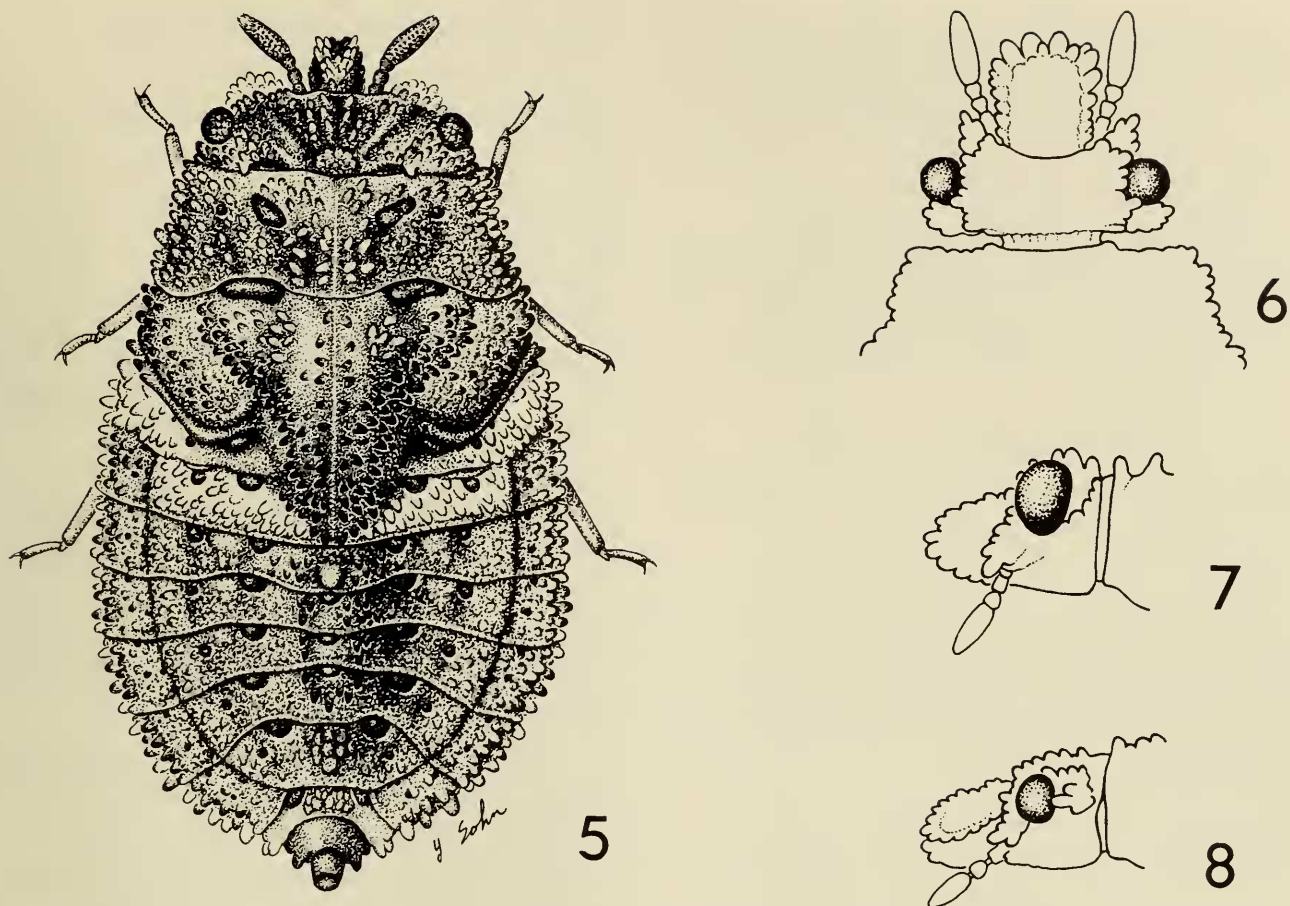
Etymology. — This new species is dedicated to Jacob Brodzinsky and his wife Marienela Lopez-Penha Brodzinsky in recognition of their realization of the scientific value of the amber collection and their assuring its availability for future students by permitting it to come to the Smithsonian Institution.

Calisiopsis kormilevi, new species

Figs. 2, 5, 7

Diagnosis. — This new species differs from all other known species in the genus by the combination of the presence of an irregular longitudinal row or prominent pale tubercles on each side of scutellar disc plus the interocular area of the head, including the midline, being strongly depressed below the upper margins of the eyes.

Description. — Holotype ♂, ovate, length 3.0, maximum width 1.45. Aspect generally characteristic for the genus with tubercles on head, in 4 discal rows on pronotum, and along margins on pronotum, abdomen, and scutellum. Head broader than long, 0.84:0.58; interocular area, including midline, depressed considerably below upper level of eyes, latter appearing strongly, obliquely elevated; anterior lobe with numerous irregularly placed, very short tubercles, dorsal outline pointing at or very slightly below midheight of eye (Fig. 7). Antenna about two-thirds as long as head, segments I–III very short (each 0.12 long), moniliform; segment IV as very slightly longer (0.40) than I–III combined, bearing numerous small pale dots.



Figs. 5-8. 5. *Calisiopsis kormilevi*, new species, nymph, natural length 2.5; 6. *Calisiopsis planiceps* Kormilev, dorsal view of head; 7. *Calisiopsis kormilevi*, new species, lateral view of head; 8. *Calisiopsis minuta* Kormilev, lateral view of head.

Pronotum broader than long, 1.24:0.58; anterior margin transverse, collar narrowly projecting; posterior margin feebly bisinuate, broadly but shallowly convex medially. Scutellum with usual tubercle-bearing, strong, triangular elevation at middle base, midline beyond it with a row of short, prominent tubercles; disc each side of midline, half way to lateral margins, with an irregular longitudinal row of 5-6 prominent pale tubercles. Wings, except sclerotized costa, concealed under scutellum.

Connexival segments and their laterotergites exposed, the latter sloping upward to an inner edge which is not differentiated as a vertical rim (as it is in *C. brasiliensis* where it forms a continuous pale rim).

Abdomen without tubercles on ventral surface.

Color: Dark dull brown with interocular area of head, anterior lobe and humeri of

pronotum paler brown; scutellum extensively marked with yellow (large oblique area in each basal angle, thence irregularly distributed). Most tubercles yellow, but black on dorsum of anterior lobe of head, along constriction of scutellum, and in middle of lateral edge of connexival segments. Tibiae and apices of femora yellow.

Holotype ♂. — Peru: Madre de Dios, Manu Pakitza, Rio Manu, 250 m, 12°7'S, 70°58'W, 22 Sep 88, Zone 02/18/08, Tree 12 *Matisia cordata*, Tree 13 *Hirtella triandra*, Insecticidal Fogging, Erwin and Farrel colls, deposited in the Museo de Historia de Lima, Lima, Peru. Paratypes: 25 ♂ 6 ♀, 10 nymphs, same data as holotype, in that institution and in the National Museum of Natural History, Washington, D.C.

Comments. — The above description applies well to the paratypes except in the scutellar coloration: all show the large, oblique

yellow mark in the basal angles of the scutellum but exhibit considerable variation of the amount of pale markings on the remainder of the scutellar disc.

Distribution. — Peru.

Etymology. — This species is dedicated to Nicholas A. Kormilev whose 142 papers on the taxonomy of the flat bugs greatly advanced our knowledge of the Aradidae.

Calisiopsis minuta Kormilev

Calisiopsis “*minutus*” Kormilev, 1959a:221 [new species: Mexico].

Diagnosis. — This is the only member of the genus having the median area of the head higher than the dorsal margin of the eye and the outline of the anterior head lobe directed above the eye.

Distribution. — Mexico.

Calisiopsis nigrotuberculata, new species

Fig. 3

Calisiopsis ampliceps. — Kormilev, 1959a: 221.

Diagnosis. — The rather regular row of blackened tubercles each side of the scutellum's median carina provides a convenient separation of this species from all others in the genus.

Description. — Holotype ♀ ovate, length 3.4, greatest width 1.6. Aspect typical for genus with prominent tubercles on head, in four longitudinal rows on pronotal disc, along lateral margins of pronotum, abdomen, scutellum, and connexival laterotergites, and in a slightly irregular, longitudinal row on each side of median carina of scutellum.

Head: Wider than long, 0.80:0.58; interocular area depressed each side of median line, latter as high as eyes. Antenna about two-thirds as long as head; segments I–III very short (0.14:0.10:0.12), almost moniliform, their combined lengths slightly less than length of segment IV (0.40), latter fu-

siform, with small yellow dots (right antenna with segments III–IV missing). Anterior lobe laterally with very low (shorter than wide) tubercles forming a regular dorsolateral row and an irregular lateral row. Anterior lobe with dorsal outline directed at upper margins of eyes.

Pronotum wider than long, 1.96:0.64. Anterior margin transverse, collar very slightly projecting; posterior margin broadly, shallowly bisinuate.

Scutellum with mediobasal elevation bearing three prominent tubercles laterally, midline behind elevation with a slight but distinct carina topped with a row of small tubercles; disc each side of midline with an almost straight row of elevated, darkened tubercles.

Connexival segments and their laterotergites exposed, latter mesally sloping abruptly upward to form a continuous rim.

Abdomen: Ventrally without tubercles.

Color: Brown; scutellum subbasally and subapically with pale areas, the latter less distinct, reaching to margin. Tubercles, except those along median of head, medioapically on pronotum, on elevated scutellar base, and row along posterior margin of each connexival segment, concolorous brown.

Holotype ♀. — “SLP Mex[ico], Lar[edo], Tex[as]. 55540, 5-23-55-5495, with orchids. *Calisiopsis ampliceps*, Det. N. A. Kormilev 957.” Deposited in the National Museum of Natural History, Washington, D.C.

Comment. — Although the specimen with the data reported by Kormilev (1959a:221) was not found, the specimen used here (one intercepted on Mexican orchids being transported into Texas) presents no important differences from his description of *C. ampliceps* given there.

Distribution. — Mexico.

Etymology. — The species name is given to direct attention to the longitudinal row of black tubercles on the scutellum each side of its median carina.

Calisiopsis planiceps Kormilev

Fig. 6

Calisiopsis planiceps Kormilev, 1976:69
[new species: Brazil].

Diagnosis. — The presence of a single row of long spines radiating out from the free margins of the anterior lobe of the head (Fig. 6) marks this species distinct from all others in the genus.

Distribution. — Brazil.

Acknowledgments

Appreciation is expressed to W. R. Doling, of the British Natural History Museum, for loan of the types of *Calisiopsis ampliceps* from that institution; to T. J. Henry, U.S. Department of Agriculture, for safely hand-carrying those specimens to me; to T. L. Erwin for permission to examine specimens taken during the canopy survey by the Biolat Program of the National Museum of Natural History (Smithsonian Institution) in Peru; to Y. T. Sohn, Smithsonian illustrator, for the excellent illustrations; to Ms. S. B. West, Smithsonian secretary, for aid in preparing the final manuscript; to O. S. Flint, Jr., T. J. Henry and T. Vasarhelyi for careful and helpful reviews of the manuscript; and to G. Steyskal for pointing out that the ending *-opsis* is feminine.

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